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(54) Abstract Title
Load engagement means used with a hand trolley

(57) A load engagement means for engaging a load to be supported from an elongate support element (30) (e.g. on a hand trolley) comprises a substantially rigid member (20) having an opening (40) through which the support element (30) freely passes so that the rigid member (20) is adjustably movable on the support member (30). Biasing means are provided to bias the rigid member (20) to turn or tilt in a first direction (X) about a region of contact between the rigid member (20) and the support element (30) such that there is a frictional engagement between sides (50, 55) of the opening (40) and the support element (30).

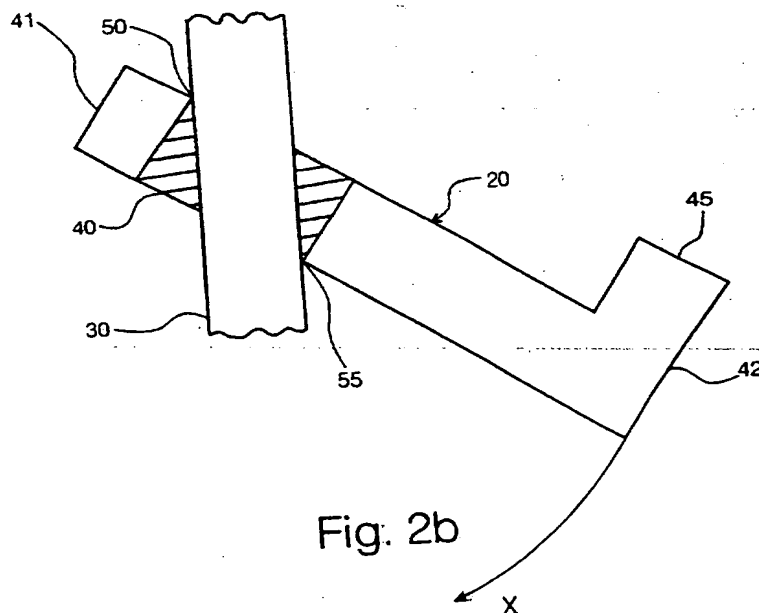


Fig. 2b

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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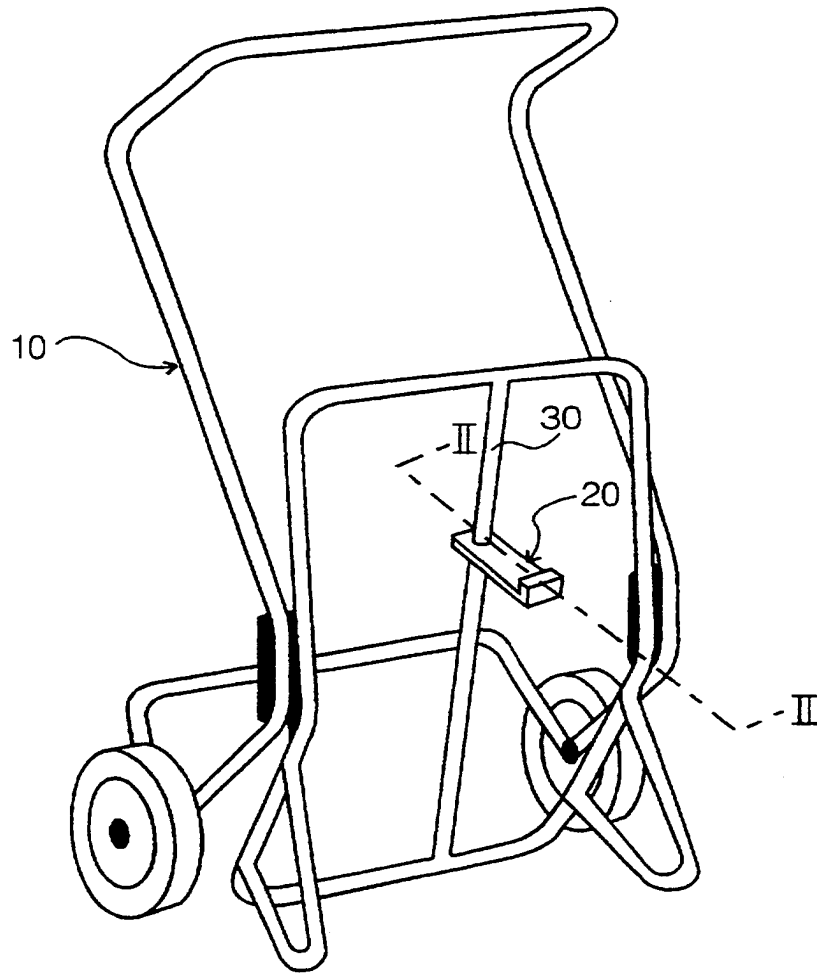
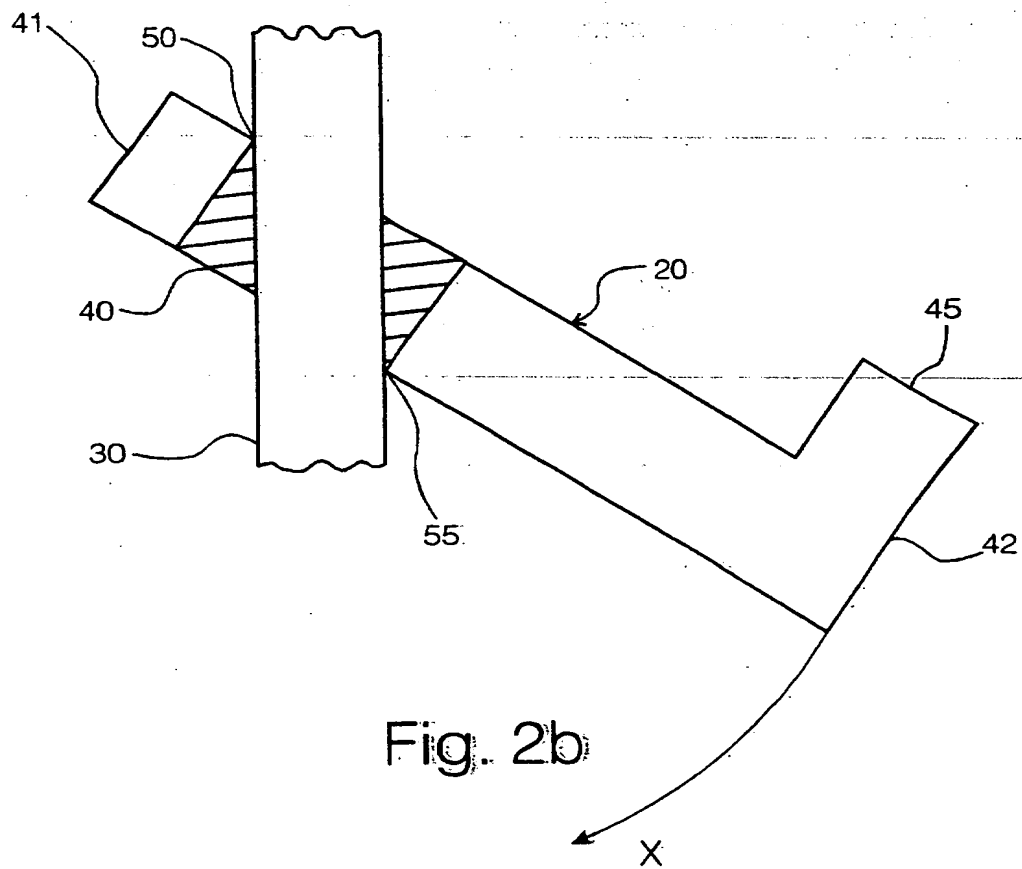
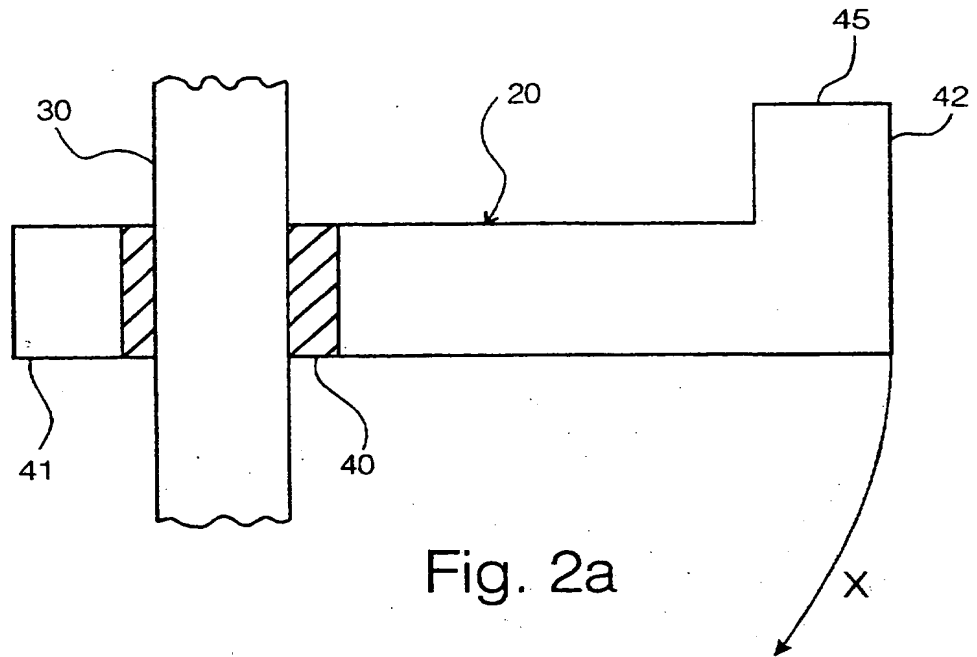
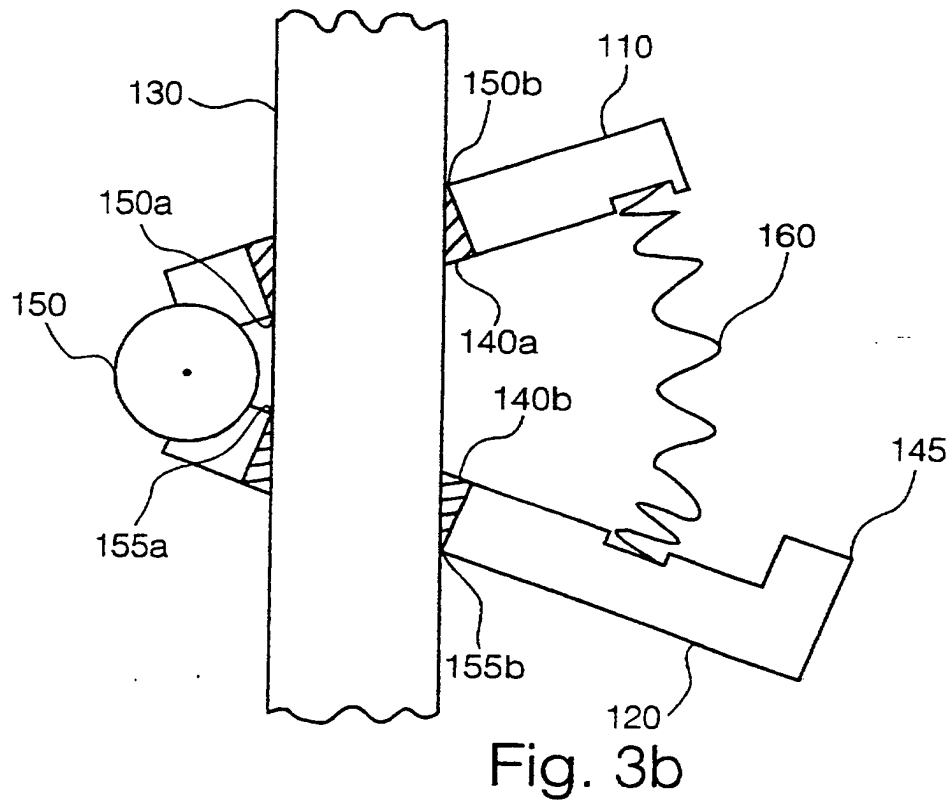
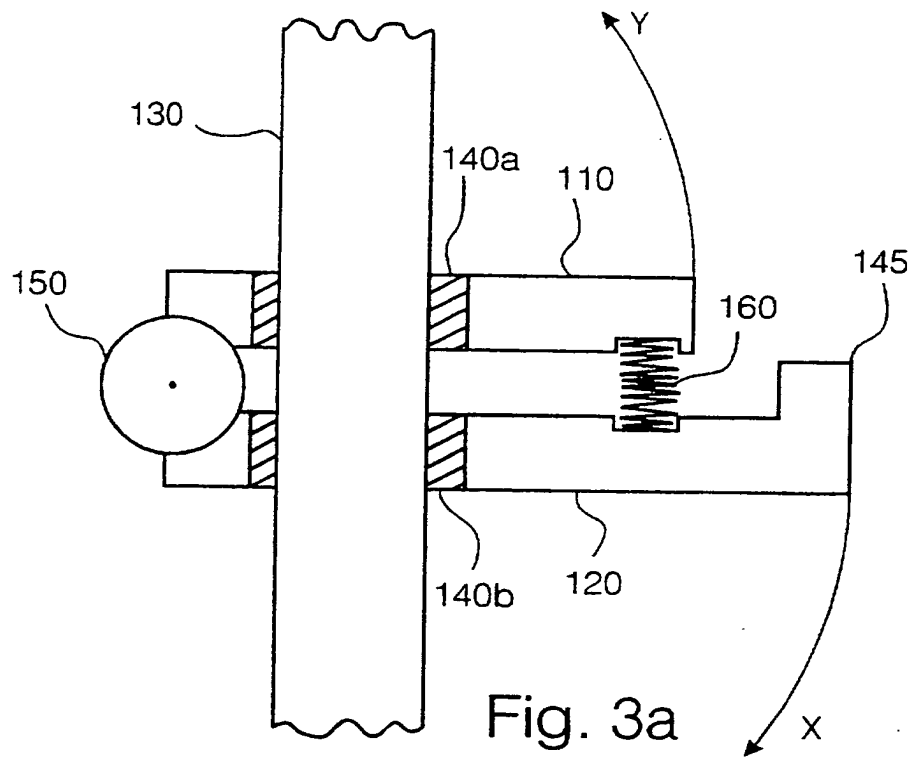


Fig. 1





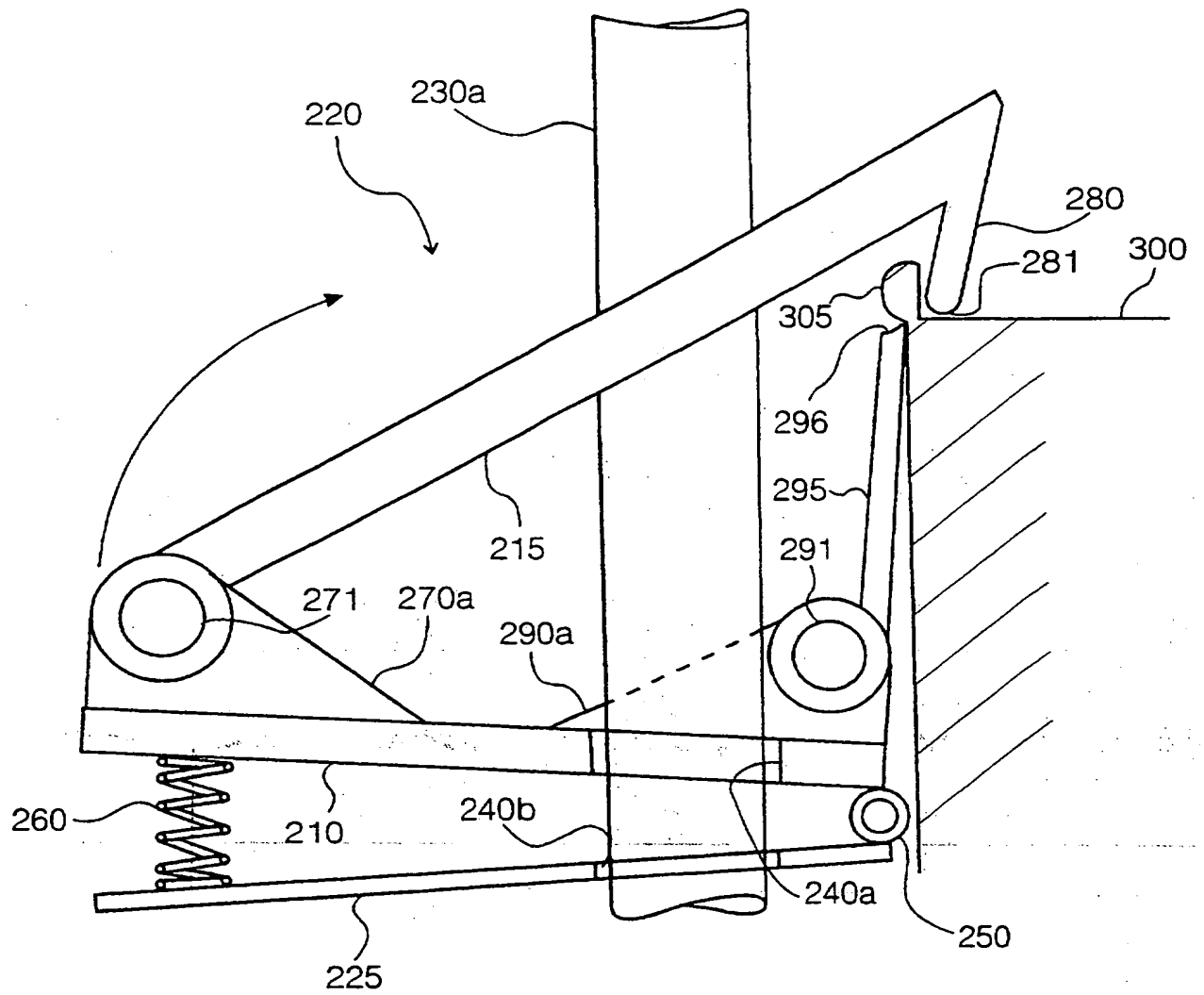


Fig. 4



AN ADJUSTABLE LOAD-ENGAGING DEVICE

The present invention relates to a device for engaging a load which is too heavy or bulky to be carried, in which the device, in use, is carried on or by an elongate support
5 element such as the frame of a hand truck or trolley.

Various different devices for engaging a load to be supported from an elongate support element of this type are known, such as grips, clips, clamps or hooks. In general the position of a load with respect to such an elongate support is not constant, due to
10 variations in the dimensions of loads and in some cases the location of a co-operating member on the load which must engage with the load-engagement device. It is therefore an advantage for a load-engagement device to be adjustable in position with respect to the elongate support element with which it is associated. There are
circumstances in which it would be an advantage for the position of the load-
15 engagement device to be adjustable along the length of the elongate support element.

Accordingly there is provided a load-engagement device for engaging a load to be supported from an elongate support element and adjustable in position along the said support element, having a substantially rigid member with a first opening through
20 which the said support element can pass freely, biasing means for biasing the said substantially rigid member to turn in a first direction about its region of contact with the support element whereby to increase the frictional engagement between sides of the first opening and the support element, and in which the force exerted thereon by the said load tends to turn the said member in the said first direction.

This has the advantage that it enables selection of the position of the load-engagement device in such a way that addition of the load does not tend to weaken, and indeed strengthens, the association between the load-engagement device and the elongate support element, such that the load-engagement device will not move during transport of the load.

In some embodiments the biasing means may be resilient and work against a counteracting member. In such embodiments the counteracting member may be engageable to the support element by a second opening through which the support element can pass freely.

As the substantially rigid member is caused to turn in the first direction the counteracting member may be caused to turn in a second and opposite direction whereby to increase the frictional engagement between sides of the second opening and the support element. The respective frictional forces provided by the frictional engagement between sides of the first and second openings may be oppositely acting.

In some embodiments the device as a whole may be completely separable from the support element. In this way the device may be removed if required and/or transferred between different support elements if desired.

In some embodiments the openings may be formed as slots; in order to make the device removable such slots may be open-ended. Preferably the slots have parallel rectilinear

sides.

The counteracting member may be pivotally connected to the said substantially rigid member.

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Although in some embodiments the load-engagement means may be a single element, in other embodiments there are provided engagement means comprising first and second co-operating parts. The first and second co-operating parts may engage either side of a portion of the load, and be so formed that the force applied by the load
10 therebetween causes them to approach each other.

The first co-operating part may be pivotally attached to the substantially rigid member at a first position, and the second co-operating part may be pivotally attached to the substantially rigid member at a second position.

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In some embodiments one or both of the first and second co-operating parts include resilient biasing means for urging at least a portion thereof towards and engagement position.

20 Various embodiments of the present invention will now be more particularly described by way of example, with reference to the accompanying drawings, wherein like reference characters refer to like parts, in which:

Figure 1 is a perspective view of an embodiment of the present invention, in which the load-engagement device is associated with an elongate support element:

forming part of a load-bearing trolley;

Figure 2b is a cross-section taken along line II-II of Figure 1 showing the load-engagement device orientated to allow movement relative to the elongate support;

Figure 2b shows the load-engagement device of Figure 2a having being turned
5 in a first direction about its region of contact with the elongate support element;

Figures 3a and 3b shows a load-engagement device formed as an alternative embodiment of the present invention in positions corresponding to those in Figures 2a and 2b respectively;

Figure 4 shows a side view of a further embodiment of the present invention
10 formed with alternative means for engaging and retaining a load; and

Figure 5 is a perspective view of the load-engagement device of Figure 4.

Referring first to Figure 1 there is shown a load-bearing trolley 10 of known construction, having a load-engagement device 20 adjustably associated with an
15 elongate support element in this embodiment formed as a vertical strut 30.

As can be appreciated from the figure, for different sized loads to be engaged by the load-engagement device 20, the device 20 will be required to move relative to the strut
30.

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Referring now to figures 2a, and 2b the device 20 is generally rectangular in section and has an opening 40 located closely adjacent one end 41 thereof to enable the device 20 to pass freely over the strut 30 so as to be easily adjustable along its length. The opening 40 has a dimension sufficiently greater than the width of the strut 30 as to

allow the device 20 to rock between the positions shown in Figures 2a and 2b.

At the end 42 of the device remote from the opening 40 at end 41 a hook portion 45 projects upwardly. Because the opening 40 is close to end 41 the device will tend to
5 turns under its own weight to the position shown in Figure 2b; the device may be weighted at the hook portion 50 end. In this way the device is certainly biased to turn about the strut 30 in a first direction indicated by the arrow X, towards the position shown in Figure 2b.

10 In the position shown in Figure 2b the device 20 frictionally engages the strut 30 at points 50 and 55 on the sides of the opening 40 so that the device 20 is locked in position.

When the hook portion 45 is used to engage a corresponding projection on a load (not
15 shown) and the load is subsequently lifted by the trolley 10 the force applied by the load serves further to turn the device in the first direction X whereby further to increase the frictional forces at points 50, 55.

To adjust the position of the device 20 relative to the strut 30 therefore the device 20
20 is first turned towards the position shown in Figure 2a by a user before sliding the device 20 over the strut 30.

Referring now to Figures 3a and 3b there is shown an alternative embodiment of the present invention further including a co-operating member.

In this embodiment the device is formed as two plates 110, 120 each having an opening, in this embodiment formed as slots, 140a, 140b each having parallel rectilinear sides to allow each plate to pass freely over the strut 130. The plate 120 has a hook
5 portion 145 for engagement with a corresponding projection on a load. In embodiments having such slots, each side of each plate may have a slot and the device may be located between two struts as shown best in Figure 5.

The plates 110, 120 are pivotally connected at one end by a hinge 150; at the other end
10 of each plate a compression spring 160 spans the plates 110, 120 and urges them towards the position shown in Figure 3b.

Figure 3a shows the plates 110, 120 lying generally parallel following compression of the spring 160 by application of pressure by a user to the plates 110, 120 in the region
15 of attachment of the spring thereto. The sides of the slots 140a, 140b are generally parallel to the length of the strut 130 and both of the plates 110, 120 may pass freely over the strut 130.

When the desired position of the device along the length of the strut is achieved the
20 spring 160 is released whereby to urge to the plates 110, 120 to turn, in first direction X and second direction Y respectively, to the position shown in Figure 3b. In this position, in the same way as the device shown in Figures 2a and 2b, the sides of slots 140a, 140b frictionally engage the strut at points 150a, 150b, 155a, 155b to hold the device in position. The frictional forces at points 150a, b and 155a, b are oppositely

acting.

Referring now to Figures 4 and 5 there is shown a further alternative embodiment having alternative means for engaging a load. The plates 210, 225 are pivotally connected at edges 211, 226 by a hinge 250. Each plate 210, 225 has an open-ended slot 240a, 240b at each end which allows the device 220 to be removably fitted between two struts 230a, 230b. The working of plates 210, 225, hinge 250 and compression spring 260 in conjunction with slots 240a, 240b to allow adjustment of the device 220 as whole with respect to the struts 230a, 230b is exactly the same as described above in relation to Figures 3a and 3b. However, in this embodiment the plate 225 does not have a hook portion and the load is engaged so as to be proximal the hinge 250 as can be seen in Figure 4.

The plate 210 has two pair of mounting lugs 270a, b and 290a, b at opposite sides thereof.

The lugs 270a, b are spanned by a spindle 271 by which an arm 215 is pivotally connected at one end to the plate 210. The other end of the arm 215 has a hook plate 280 lying transversely thereto and projecting downwardly, terminating in an operating end 281.

The lugs 290a, b are spanned by a spindle 291 by which a rectangular plate 295 is pivotally connected along one side to the plate 225; the opposite side of the plate 295 is an operating end indicated 296.

In some embodiments the rectangular plate 295 is resiliently biased to the upstanding position, in which the plate 295 is orthogonal to the plate 225, as shown in the figure whereby to be ready to engage a load.

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In use, a load 300 is introduced so that the operating ends 281, 296 of the hook plate 280 and rectangular plate 295 engage either side of a projection 305, such as the beaded rim of an oil barrel. The length of the arm 215 is greater than the distance between the spindles 271, 291, which allows the hook plate 280 to engage the other
10 side of the projection 305 to the plate 295.

The force applied by the load 300 is such that, in addition to tending to turn device 220 in the first direction X, the load tends to cause the operating ends 281, 296 of the hook plate 280 and rectangular plate 295 to approach whereby to grip the projection 305.

15 Although in this embodiment the gripping is achieved with no additional biasing of the operating ends 281, 296 towards each other, in some embodiments one or both of the arm 215 and the plate 295 may be so biased which may involve resilient biasing using, for example, a spring.

20

CLAIMS

1. A load-engagement device for engaging a load to be supported from an elongate support element and adjustable in position along the said support element,
5 having a substantially rigid member with a first opening through which the said support element can pass freely, biasing means for biasing the said substantially rigid member to turn in a first direction about its region of contact with the support element whereby to increase the frictional engagement between sides of the first opening and the support element, and in which the force exerted thereon by the said load tends to turn the said
10 member in the said first direction.
2. A load-engagement device as claimed in Claim 1, in which the said biasing means is resilient and works against a counteracting member.
- 15 3. A load-engagement device as claimed in Claim 2, in which the said counteracting member is engageable to the said support element by a second opening through which the said support element can pass freely.
4. A load-engagement device as claimed in Claim 3, in which as the said
20 substantially rigid member is caused to turn in the said first direction the said counteracting member is caused to turn in a second and opposite direction whereby to increase the frictional engagement between sides of the second opening and the support element.

5. A load-engagement device as claimed in Claim 4, in which the respective frictional forces provided by the frictional engagement between sides of the first and second openings are oppositely acting.

5 6. A load-engagement device as claimed in any preceding claim, in which the said opening is a slot.

7. A load-engagement device as claimed in any of Claims 2 to 7, in which the said counteracting member is pivotally connected to the said substantially rigid member.

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8. A load-engagement device as claimed in any preceding claim, in which the said opening has parallel rectilinear sides.

9. A load-engagement device as claimed in any preceding claim, in which the load-
15 engagement means comprise first and second co-operating parts.

10. A load-engagement device as claimed in Claim 9, in which the said first and second co-operating parts engage either side of a portion of the load, and the force applied by the load therebetween causes them to approach each other.

20

11. A load-engagement device as claimed in any of Claims 9 to 11, in which the said first co-operating part is pivotally attached to the substantially rigid member at a first position.

12. A load-engagement device as claimed in any of Claims 9 to 11, in which the said second co-operating part is pivotally attached to the substantially rigid member at a second position.

5 13. A load-engagement device as claimed in any of Claims 9 to 12, in which one or both of the first and second co-operating parts include resilient biasing means for urging at least a portion thereof towards an engagement position.

10 14. A load-engagement device substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

Amended claims have been filed as follows

1. A load-engagement device for engaging a load to be supported from an elongate support element and adjustable in position along the said support element,
5 having a substantially rigid member with a first opening through which the said support element can pass freely and means for engaging the load such that it can be suspended therefrom, biasing means for biasing the said substantially rigid member to turn in a first direction about its region of contact with the support element whereby to increase the frictional engagement between sides of the first opening and the
10 support element, and in which the force exerted thereon by the said load tends to turn the said member in the said first direction.
2. A load-engagement device as claimed in Claim 1, in which the said biasing means is resilient and works against a counteracting member.
15
3. A load-engagement device as claimed in Claim 2, in which the said counteracting member is engageable to the said support element by a second opening through which the said support element can pass freely.
- 20 4. A load-engagement device as claimed in Claim 3, in which as the said substantially rigid member is caused to turn in the said first direction the said counteracting member is caused to turn in a second and opposite direction whereby to increase the frictional engagement between sides of the second opening and the support element.

5. A load-engagement device as claimed in Claim 4, in which the respective frictional forces provided by the frictional engagement between sides of the first and second openings are oppositely acting.

5

6. A load-engagement device as claimed in any preceding claim, in which the said opening is a slot.

7. A load-engagement device as claimed in any of Claims 2 to 7, in which the
10 said counteracting member is pivotally connected to the said substantially rigid member.

8. A load-engagement device as claimed in any preceding claim, in which the said opening has parallel rectilinear sides.

15

9. A load-engagement device as claimed in any preceding claim, in which the load-engagement means comprise first and second co-operating parts.

10. A load-engagement device as claimed in Claim 9, in which the said first and
20 second co-operating parts engage either side of a portion of the load, and the force applied by the load therebetween causes them to approach each other.

11. A load-engagement device as claimed in any of Claims 9 to 11, in which the said first co-operating part is pivotally attached to the substantially rigid member at

14
a first position.

12. A load-engagement device as claimed in any of Claims 9 to 11, in which the
said second co-operating part is pivotally attached to the substantially rigid member
5 at a second position.

13. A load-engagement device as claimed in any of Claims 9 to 12, in which one
or both of the first and second co-operating parts include resilient biasing means for
urging at least a portion thereof towards an engagement position.

10

14. A load-engagement device substantially as hereinbefore described with
reference to, and as shown in, the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0007678.6
Claims searched: 1 - 14

Examiner: Peter Macey
Date of search: 2 February 2001

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): B7B (BTC, BTL1, BTL2, BTX2)

Int Cl (Ed.7): B62B 1/04, 1/06, 1/12, 1/14, 1/20, 1/22, 3/02, 3/04

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 517569 (COTCHETT) see figure 2 and page 2 lines 95 - 101	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention:
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